

It should be noted that many of the proponents will be contributing substantially to the complement of equipment for production of the test materials, and the Working Party believes the proponents can and should utilize this same equipment for producing their own test materials as needed for their own developmental purposes. This should be a separate effort, however.

#### Ownership of Test Materials

Working Party 6 has discussed the issue of final ownership of the test materials, but has not reached any specific recommendation on this matter. Ownership of the test materials by some responsible entity is important to their care, handling, release and usage. The Working Party hereby formally requests guidance from the FCC Advisory Committee on this matter. Exclusivity is also an issue which must be addressed.

#### Conduct of the Subjective Testing

The Working Party has taken note of the offer by the Communications Research Center of the Canadian Department of Communications to conduct the subjective assessments of ATV systems. The Working Party urges the FCC Advisory Committee to formally review this offer and issue a formal acceptance if appropriate. Detailed planning is now underway, and time will be lost if late changes are made in the location and management of the subjective testing.

#### Other Subjective Tests vs. those of the FCC Advisory Committee

Working Party 6, in its last meeting, observed that other organizations, both commercial and academic, have announced their intention to conduct subjective assessments of advanced television systems. The Working Party wishes to distinguish the subjective testing being planned by the FCC Advisory Committee from these other efforts. Tests conducted by other organizations are being conducted for many and varied reasons, and their results should not necessarily be construed as relevant to the FCC Advisory Committee's purposes. The Advisory Committee's tests have been and are being planned in a multi-year public process geared specifically to provide the Federal Communication Commission the necessary information for an eventual decision on selection of a terrestrial broadcast standard for advanced television service. As national and international activity in advanced television systems continues, this distinction should be kept in mind.

## **PSYCHOACOUSTIC TESTS**

In spite of the fact that a psychoacoustic test design was attached to the previous Chairman's Report, it is important to emphasize that no psychoacoustic tests are planned at this time, even if a complete system is presented to the ATTC for test. No test material has been recommended, nor will anything be prepared. No subjective test procedures manual has been planned.

It has been conjectured that these ATV systems may be of such excellent quality that psychoacoustic tests may never become necessary. It is expected that the sound will be state-of-the-art, i.e., digital, multichannel (stereo at minimum) etc., and therefore, the quality will be well beyond the capability of the human-hearing mechanism to distinguish differences.

It is recognized that this issue may be sensitive to some proponents, especially as it may pertain to the ATTC fee structure.

## **DISCUSSION**

A few issues have surfaced which do not fall into the previous sections. The issue of ownership and copyright of the test materials is such an issue, and PSWP6 seeks the guidance of the Planning Subcommittee as to how to proceed.

Subjective test sites in North America need to be identified and affirmed by whatever authorized official body can undertake such a task.

There may be a need for some funding for test material as has been mentioned. Again, PSWP6 seeks the advice of the Planning Subcommittee.

The level of authority and make-up of the expert panel is another issue on which PSWP6 seeks guidance. It recently has become clear that the panel will have an enormous amount of work and a good deal of responsibility to go with it.

Who will volunteer these experts? The FCC? SMPTE? CABSC? A related issue is who will make the decisions regarding full subjective assessments versus deferring such tests by means of range recording only? It must be a body which can act quickly. Should it be the Advisory Committee? The expert panel? Once again, PSWP-6 seeks guidance from the Planning Subcommittee as to the answers to these questions.

**AD HOC GROUP ON STILL TEST MATERIAL FOR SUBJECTIVE ASSESSMENTS**  
**NOVEMBER 17, 1989, NCTA, WASHINGTON, DC**

The members of this Group were E. Crutchfield, C. Tanner, P. Hearty, W. Whyte, B. James and B. Jones. Still picture material shot by a professional NASA photographer was reviewed. The objective was to determine whether the combination of this NASA material and the Kodak material would fulfill all of the requirements for still material for subjective picture quality and impairment assessments. It was determined that all requirements were met except for two or possibly three pictures. Those still needed are for the attributes of color and luminance dynamic range and possibly depth portrayal (the reason for this uncertainty is that NHK may provide the latter).

Twelve photographs were reviewed. Four were rejected because a better picture for a specific attribute exists. Two (a 16:9 flower arrangement with blue background and a closeup of a woman with a salmon background) were kept as possibilities for impairment stills in case the other choices should prove insensitive. Two were good possibilities but will be reshot (the Oberlin Arch for depth and the candy for color dynamic range). Four were accepted as presented: little girls with toys for peripheral performance, a fruit scene for color rendition (this will be compared with the Kodak fruit and will be rejected if redundant), the wavy white wall for luminance rendition and a row of flags on poles for static chrominance resolution.

The attributes list for still picture quality material has been narrowed from 14 to 9 and for motion from 16 to 14, four of which do not need to be shot since 3 are film source (which we may have) and 1 is electronic. The still picture impairment material has been identified and is ready for validation.

As of this date Kodak has agreed to review any new still material for its suitability for scanning, and will do the scanning for \$2k per image. The possibility that they will donate the scanning costs if given enough lead time is being pursued.

The new attributes from PSWP1 were reviewed and determined to be either objective in nature or, in the case of video cuts, video peaking and image enhancement, and camera unsteadiness, deserving of "expert observation and commentary".

**AD HOC GROUP ON SUBJECTIVE TEST PROCEDURES MANUAL REVIEW**  
**November 15 - 17, 1989, NCTA, Washington, D.C.**

The members of this Group are T. Gurley, W. Whyte, C. Tanner, P. Hearty, B. James and B. Jones representing PSWP6 and SSWP2. They conducted an intensive two and one-half day meeting in which the Manual was reorganized, the number of subjective tests recommended for immediate assessment was significantly reduced as was the number of picture-quality attributes.

The substance of the Manual was reviewed and found to be quite complete, but the organization underwent a major restructuring. The Table of Contents will be changed to become more of a look-up table, ie. the document will be reorganized by specific test, rather than by test type or category. This type of organization is very repetitive, but it ensures that a reader, even if unfamiliar with specific terminology etc, can find the necessary sections for each particular task.

A significant new concept which has the potential to save time and money originated at the meeting. The concept is called "Range Recording Only" (RRO). It applies to impairment tests which are an order of magnitude greater in number than the quality tests (present estimate: 8:1). Master tapes of the appropriate test pictures and impairments levels will be made, but the decision of when (or whether) to conduct full subjective assessments will be deferred. The Group speculated that such decisions might be made by SSWP 1 or 4. RRO allows for a reduction in tape-recording and technician time in that the randomization and editing process can be deferred or possibly eliminated. The potential saving can be substantial since it is anticipated that for some ATV systems, a full set of subjective tests may never become necessary. Our present draft shows 16 tests recommended for a deferred decision regarding full subjective assessment.

Test prioritization was another important activity, which also centered on the interference and other impairment tests since they represent the large majority of the total number of tests. These recommendations are now under review prior to distribution.

The Group observed that the expert panel's observation and commentary (EO&C) constitutes a new category of test results, and that an appropriate group within either the Planning or Systems Subcommittee should develop a procedure for determining precisely how this EO&C should be conducted and placed in the record.

DRAFT PRIORITY FOR INTERFERENCE SUBJECTIVE TESTS

INTF. ERENCE	E O + C	THRES. ONLY	R R O	SUBJ.
1. Co-Channel (ATV into NTSC)				X
2. Upper Adjacent (ATV into NTSC)				X
3. Lower Adjacent (ATV into NTSC)				X
4. UHF Taboos <sup>1</sup> (WC) (ATV into NTSC)				X
*5. Co-Channel (NTSC into ATV)			X	
*6. Upper Adjacent (NTSC into ATV)			X	
*7. Lower Adjacent (NTSC into ATV)			X	
*8. UHF Taboos <sup>1</sup> (NTSC into ATV)			X	
*9. Co-Channel (ATV into ATV)			X	
*10. Upper Adjacent (ATV into ATV)			X	
*11. Lower Adjacent (ATV into ATV)			X	
*12. UHF Taboos <sup>1</sup> (ATV into ATV)			X	
13. Discrete Freq. Interference		X		

OTHER IMPAIRMENTS	E O + C	THRES. ONLY	R R O	SUBJ.
1. Carrier-To-Noise (Broadcast)				X
2. Carrier-To-Noise (Cable)				X
3. Multipath				X
4. Microflextions				X
*5. Impulse Noise			X	
*6. Intermodulation Distortion			X	
*7. Cross Modulation Distortion			X	
*8. ICPM (Broadcast) (As Req'd.) <sup>2</sup>			X	
*9. ICPM (Cable)			X	
10. Group Delay (As Req'd.) <sup>2</sup>			X	
11. Hum and Low Freq. Noise			X	
12. Main/Augmentation Channel Differential		X		
13. High Level Sweep			X	
14. Airplane Flutter		X		

\* Full subjective tests may be needed, but recommend they be postponed for later consideration.

OTHER IMPAIRMENTS	E O + C	THRES. ONLY	R R O	SUBJ.
1. Video Cuts	X			
2. Video Peaking & Image Enhancement	X			
3. Camera Unsteadiness	X			
4. Conditional Access	X			
5. Subjective Resolution	X			

E O + C - Expert Observation and Commentary

THRES. ONLY - Threshold Only

R R O - Range Recording Only

SUBJ - Subjective

- Notes-
1. All 10 UHF taboos will have ranging performed and range recordings made. Subjective testing will be performed on a selected small subset of the full group of UHF taboos on the advice of officials on spectrum usage.
  2. Will only be performed if proponent claims existing transmitter can be utilized.

## **CONTENT CRITERIA FOR THE UNDESIREO SIGNAL IN INTERFERENCE TESTS**

**Paul J. Hearty  
CABSC**

**89.12.11**

The following summarizes suggestions, from the 89.12.06 meeting of PSWP-6, on the contents of the undesired signals in ATV-to-ATV, ATV-to-NTSC, and NTSC-to-ATV interference tests.

The video portions of the undesired signals should provide repetitive changes from high to low energy levels in both luminance and chrominance. This can be done with fast and slow fades and/or by cuts that alternate between high and low energy fields. The material should contain a variety of critical content (e.g., color bars; text; multiburst; objects with sharp, high-contrast edges; etc.) and must contain motion of various sorts (e.g., moving objects, moving text, zoom, etc.). The requirement is for one 10-second sequence in ATV and NTSC. It may be possible to create this without additional production (e.g., using material prepared for the quality tests, mixed with generated signals and suitable effects during post-processing).

The audio portions of the undesired signals require further study.



Communications Research Centre  
3701 Carling Avenue  
Ottawa, Ontario K2H 8S2

11 December 1989

File: 4010-9

Ms. B. Jones  
Chair, FCC-ACATS/PSWP-6  
972 Boston Post Road  
Darien, Connecticut 06820  
U.S.A.

Dear Bronwen:

Attached are the two pieces of material called for at the 89.12.06 meeting of PSWP-6. The first summarizes current requirements for the ATV test materials. The second summarizes suggestions for the contents of the unwanted signals in interference tests (per the WP's discussions at the recent meeting).

Best wishes for the Christmas season

Paul J. Hearty  
Chair, CABSC WG on Subjective Evaluation



# REQUIREMENTS FOR TEST MATERIALS IN ATV SUBJECTIVE TESTS

P. Hearty  
CABSC

89.12.11.

## I. QUALITY (ATV BASIC QUALITY, NTSC QUALITY):

The requirements for ATV Basic Quality and for NTSC Convertible Quality now have been merged. This reduces requirements by several stills and sequences as, originally, somewhat different requirements existed for the two tests.

As a result of further reductions, the total requirement for the Quality tests is for 9 stills and 14 sequences. Of these, 5 stills have been identified (a confirmatory test may be required), 1 still and 1 sequence will be generated electronically, and 3 sequences will be taken from existing film stock.

ATTRIBUTE	NOW REQUIRED	FROM PSWP6-0070	CURRENTLY AVAILABLE
STILL PICTURES:			
Static Luminance Resolution	1	1	Buildings (KODAK)
Static Chrominance Resolution	1	2	Flags on Poles (NASA)
Luminance Rendition	1	1	Wavy Marble Wall (NASA)
Luminance Dynamic Range	1	2	<not found>
Color Gamut/Rendition	1	1	Fruit & Vegetables (KODAK)
			(alt.) Fruit (NASA)
Color Dynamic Range	1	2	<not found>
Depth Portrayal	1	1	<not found>
Peripheral Perf. (Homogeneity)	1	1	Girls with Toys (NASA)
Elect. Generated Material	1	1	<to be generated>
Film Stock (24, 30 fps)	0	2	<not needed>
	--	--	--
	9	14	5
	--	--	--

## MOTION SEQUENCES:

Dynamic Luminance Resolution	2	2	<to be shot>
Dynamic Chrominance Resolution	2	4	<to be shot>
Motion Rendition (Camera)	1	2	<to be shot>
Motion Rendition (Scene)	4	5	<to be shot>
[Motion Rendition (Combined)]	[1]	0	<to be shot>
Elect. Generated Material	1	1	<to be generated>
Film Sources (24, 30 fps)	3	2	<from existing stock>
	--	--	--
	14	16	0
	--	--	--

## II. IMPAIRMENT/INTERFERENCE (TO ATV, TO NTSC):

But for the difference in format, the requirements for Interference-to-ATV and Interference-to-NTSC tests are identical. The requirement for impairment and interference tests nominally is for 6 stills and 4 sequences. Of the latter, 1 sequence is needed for the unwanted signal in interference tests.

However, because the same material can be used for several tests, the actual requirement is for 4 stills and 2-3 sequences. Of these, all 4 stills have been identified (subject to confirmatory tests). Further, it is expected that the test sequences can be gotten by re-using materials from the quality tests and that the interfering sequence can be gotten by post-processing with existing materials and editing effects.

ATTRIBUTE	NOW REQUIRED	FROM PSWP6-0070	CURRENTLY AVAILABLE
STILL PICTURES:			
Noise and other Impairments	2	2	Kiel Harbour (CCIR) Blonde Woman (KODAK)
Multipath/Microreflections	2	2	Kiel Harbour (CCIR) Buildings (KODAK)
Co-ch/adj-ch/UHF Taboo	2	2	Kiel Harbour (CCIR) Girl with Balloons (KODAK) (alt.) Woman & Roses (NASA) (alt.) Flowers (NASA)
	--	--	--
	6	6	6
	--	--	--
MOTION SEQUENCES:			
Noise and other Impairments	1	1	<not found>
Multipath/Microreflections	1	1	<not found>
Co-ch/adj-ch-UHF Taboo	1	1	<not found>
Interferer	1	1	<to be prepared>
	--	--	--
	4	4	0
	--	--	--

## CONTENT CRITERIA FOR THE UNWANTED SIGNAL IN INTERFERENCE TESTS

Paul J. Hearty  
CABSC

89.12.11

The following summarizes suggestions, from the 89.12.06 meeting of PSWP-6, on the contents of the unwanted signals in ATV-to-ATV, ATV-to-NTSC, and NTSC-to-ATV interference tests.

The video portions of the unwanted signals should provide repetitive changes from high to low energy levels in both luminance and chrominance. This can be done with fast and slow fades and/or by cuts that alternate between high and low energy fields. The material should contain a variety of critical content (e.g., color bars; text; multiburst; objects with sharp, high-contrast edges; etc.) and must contain motion of various sorts (e.g., moving objects, moving text, zoom, etc.). The requirement is for one 10-second sequence in ATV and NTSC. It may be possible to create this without additional production (e.g., using material prepared for the quality tests, mixed with generated signals and suitable effects during post-processing.

The audio portions of the unwanted signals require further study.

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25 Jan 88

Document List for PS/WP6

PS/WP6 - 0000a

25 Jan 88

Document List

PS/WP6 - 0000b

25 Jan 88

Membership List

PS/WP6 - 0001

06 Jan 88

CCIR Rec. 500 Table III: Viewing Conditions

PS/WP6 - 0002

11 Jan 88

L. DeMarsh Comments

PS/WP6 - 0003

18 Jan 88

CBS Comments

PS/WP6 - 0004

19 Jan 88

NBC Comments

PS/WP6 - 0005

19 Jan 88

L. DeMarsh: Viewing Distance paper

PS/WP6 - 0006

19 Jan 88

Work Statement

PS/WP6 - 0007

21 Jan 88

R. Neuman Comments

PS/WP6 - 0008

22 Jan 88

PS/WP6 - 0009

29 Jan 88

Meeting Announcement

PS/WP6 - 0010

01 Feb 88

Meeting Minutes -- January 19, 1988

PS/WP6 - 0011

29 Jan 88

Capital Cities/ABC Comments

PS/WP6 - 0012  
29 Jan 88

K. Glenn Comments: Methodology

PS/WP6 - 0013  
29 Jan 88

C. Carbonara Comments: Bibliography

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10 Feb 88

F. Kolb Comments: Bibliography

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12 Feb 88

HBO Comments

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NASA Lewis Comments

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Capital Cities/ABC Comments

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Jules Cohen Comments

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DOC/CRC Comments

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NBC Comments

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18 Feb 88

Cover Letter Documents/Contribution to date

PS/WP6 - 0022  
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DOC/CRC Comments

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22 Feb 88

CBS Comments

PS/WP6 - 0024  
02 Mar 88

Outline (Psychophysics)

PS/WP6 - 0025  
29 Feb 88

Meeting Agenda and Minutes 29 Feb 88

PS/WP6 - 0026  
12 Mar 88

Drafting Party Report: Noise Weighting Contours

PS/WP6 - 0027  
30 Mar 88

Drafting Party Report: Ghost Cancellation

PS/WP6 - 0028  
30 Mar 88

Drafting Party Report: Test Material

PS/WP6 - 0029  
02 May 88

HBO Comments (including those from MIT, NBC)

PS/WP6 - 0030  
02 May 88

NASA Lewis Comment

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02 May 88

NYIT Comments

5/06/88

END OF FIRST INTERIM WORK PERIOD

PS/WP6 - 0031a  
01 Jun 88

Chair's Report

PS/WP6-0058

**PS/WP6 DOCUMENT LIST**  
**(Since June, 1988 PS Interim Report)**

PS/WP6 - 0032

13 Dec 88

Meeting Agenda

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13 Dec 88

PS/WP6 Oct 25 Meeting Minutes

PS/WP6 - 0034

13 Dec 88

Meeting Summary Specialist Group  
on Subjective Test Materials

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13 Dec 88

CBS/Dickens Document Regarding the  
Format for Test Material

PS/WP6 - 0036

13 Dec 88

Zenith letter regarding Test Material and Display

PS/WP6 - 0037

13 Dec 88

CABSC/Hearty Document Criteria for Test Material

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13 Dec 88

Draft: Viewing Test Plan Detail

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13 Dec 88

Draft: Psychoacoustic Test Design

PS/WP6 - 0040

13 Dec 88

CBS Submission: Recommended Format for Test Material

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KCH-1000 Description, Submitted by Philips Laboratories

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Letter from William Glenn

PS/WP6 - 0043

10 Jan 89

Letter from Philips Laboratories

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Letter from Kodak

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Letter from Zenith

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Letter from NBC

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Letter from DSRC

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Letter from Showscan

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Letter from William Schreiber

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Canada/US Subjective Test Methods

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ABC/Capital Cities Letter, Re: Test Materials

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NHK Letter, Re: Test Materials

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Sony Letter, Re: Test Materials

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20 Jan 89

CBS Submission, Re: Test Materials

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24 Jan 89

Meeting Minutes, PS-WP6, Dec 13, 1988

PS/WP6 - 0056

25 Jan 89

NASA, Re: 1125/60 Transcoding

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24 Jan 89

Consolidated Minutes of Two Meetings: The Specialist Group on Test Materials, and PS/Working Party 6

PS/WP6 - 0058

01 Feb 89

Chair's Report

PS/WP6 - 0058a

06 Feb 89

Document List for PS/WP6  
(Since June, 1988 PS Interim Report)

END OF SECOND INTERIM WORK PERIOD



<u>PS/WP6 - 0059</u> 27 Feb 89	Test Materials Specialist Group Meeting, Minutes, February 27, 1989
<u>PS/WP6 - 0059a</u> 28 Mar 89	Letter from ATTC Rhodes to PSWP6 Chair, Jones Re: display
<u>PS/WP6 - 0059b</u> 14 Apr 89	Distribution to PSWP6 members Re: Displays at NAB Convention.
<u>PS/WP6 - 0060</u> 01 June 89	Meeting Notice/Agenda June 14, 1989, Meeting at NAB
<u>PS/WP6 - 0061</u> 14 June 89	NBC Comments on February 1989 Chair's Report
<u>PS/WP6 - 0062</u> 14 June 89	ATTC Notice: No additional signal format facilities after June 1989
<u>PS/WP6 - 0063</u> 12 June 89	Outline of Subjective Test Procedures Manual
<u>PS/WP6 - 0064</u> 19 June 89	StellaCom, Inc. HDTV Report: Contract NASW - 4376
<u>PS/WP6 - 0065</u> 30 June 89	Third Chair's Report
<u>PS/WP6 - 0066</u>	
<u>PS/WP6 - 0067</u> 20 July 89	PSWP-6 Meeting Minutes, June 14, 1989 at NAB
<u>PS/WP6 - 0068</u> 27 July 89	Letter from Specialist Group Chair, Tanner to PS Chair, Flaherty
<u>PS/WP6 - 0069</u> 02 Aug 89	Memo to PSWP6 From Specialist Group Chair Tanner
<u>PS/WP6 - 0070</u> 20 July 89	Test Materials: CABSC - P. J. Hearty
<u>PS/WP6 - 0071</u> 03 Aug 89	Letter: J. Huffman & Associates

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27 Aug 89

Ad Hoc Group: Test Material Creation; Draft  
Proposed Budgets

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29 Aug 89

Agenda/Meeting Notice: PSWP6

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29 Aug 89

PSWP6 Meeting Minutes

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31 Aug 89

Agenda/Meeting Notice: Ad Hoc Group  
Production Planning

PS/WP6 - 0074  
06 Sept 89

Memo from M.D. Davis (ABC) to Ad Hoc Group  
Chair: Godber, Re: budget

PS/WP6 - 0075  
07 Sept 89

Letter to PSWP6 Chair, Jones & Vice Chair, Tanner from  
M.D. Davis, ABC

PS/WP6 - 0076  
11 Sept 89

Letter from PSWP-6 Chair, Jones to Paramount  
Pictures, Carpenter

PS/WP6 - 0077  
12 Sept 89

Meeting Notice/Agenda  
Ad Hoc Group on Production Planning

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15 Sept 89

List of Possible Funding Sources  
Ad Hoc Group on Production Planning

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15 Sept 89

Site Selection for Production  
Ad Hoc Group on Production Planning

PS/WP6 - 0080  
15 Sept 89

Evaluating Subjective Image Quality  
Ad Hoc Group on Production Planning

PS/WP6 - 0081  
15 Sept 89

Identification & Labeling of Test Material Sequences  
Ad Hoc Group on Production Planning

PS/WP6 - 0082  
21 Sept 89

Letter from P. M. Fannon, ATTC, to PSWP-6 Chair, Jones  
Re: Test Materials Decision

PS/WP6 - 0083  
22 Sept 89

Letter to Zenith from Test Material Chair, Tanner  
Re: Telecine

PS/WP6 - 0084  
27 Sept 89

Summary Record of 9-21-89 Teleconference on ATV  
Test Material

PS/WP6 - 0084a  
30 Sept 89

Draft Subjective Test Procedures Manual

PS/WP6 - 0085  
02 Oct 89

Letter from Faroudja to PSWP6 Chair,  
Jones, Re: Test Materials

PS/WP6 - 0086  
02 Oct 89

Agenda and Action Items  
Ad Hoc Group on Production Planning

PS/WP6 - 0087  
04 Oct 89

Meeting Notice & Agenda, PSWP-6 Meeting at NCTA

PS/WP6 - 0087a  
04 Oct 89

Meeting Minutes

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13 Oct 89

Letter from ATTC Chief Scientist to Faroudja,  
Re: PSWP6-0085

PS/WP6 - 0089  
13 Oct 89

Agenda & Attachments  
Ad Hoc Group on Production Planning

PS/WP6 - 0090  
20 Oct 89

Letter from Zenith to Test Material Chair,  
Tanner, Re: PSWP6-0083

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20 Oct 89

Letter to ATTC Chief Scientist  
from Faroudja, Re: PSWP6-0088

PS/WP6 - 0092  
23 Oct 89

FAX (copy of) to PS Chair, Flaherty from  
PM Fannon, Re: Warner Brothers offer of film

PS/WP6 - 0093  
31 Oct 89

Letter from ATTC Chief Scientist to  
B. Caron, CRC, RE: Display

PS/WP6 - 0094  
01 Nov 89

Letter from Specialist Group Chair, Tanner to  
Ad Hoc Group Chair, Godber, Re: Test Materials

PS/WP6 - 0095  
06 Nov 89

Letter from ATTC Chief Scientist to Faroudja  
Re: Test Materials format

PS/WP6 - 0096  
08 Nov 89

Letter from PSWP2 Chair, Green to PSWP6 Chair, Jones  
Re: PSWP/attributes

PS/WP6 - 0097  
10 Nov 89

Agenda for Meeting at Philips  
Ad Hoc Group Production Planning

PS/WP6 - 0098  
13 Nov 89

Letter from ATTC Chief Scientist to R. Streeter, CBS  
Re: Japanese Test Material

PS/WP6 - 0099  
18 Nov 89

Letter from Test Material Chair, Tanner, to Warner  
Re: film reel received

PS/WP6 - 0100  
24 Nov 89

Letter from PSWP6 Chair, Jones to PSWP2 Chair, Green  
Re: PSWP1 attributes

PS/WP6 - 0101  
27 Nov 89

Letter from ATTC director Fannon to Test Materials  
Chair Tanner, Re: format converter

PS/WP6 - 0102  
28 Nov 89

Draft Agenda & Meeting Notice at ATTC

PS/WP6 - 0103  
29 Nov 89

Letter from Tanner, V-C of PSWP6 to Fannon, ATTC  
director, Re: display tape editing, format converter,  
etc.

PS/WP6 - 0104  
30 Nov 89

Meeting Announcement: Ad Hoc Group on  
Production Planning

PS/WP6 - 0105  
30 Nov 89

Letter from PSWP Vice-Chair Tanner to PS Chair Flaherty  
Re: Test material distribution

PS/WP6 - 0106  
01 Dec 89

Hearty/CABSC Comments  
Re: "Range Recording Only"

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04 Dec 89

Information Document Baylor University  
Center for New Communication Technologies

PS/WP6 - 0108  
06 Dec 89

Meeting Notice & Agenda PSWP-6 at CBS in NYC

PS/WP6 - 0109  
11 Dec 89

Letter from PSWP-6 Chair, Jones to PS Chair, Flaherty  
Re: test material distribution decision

PS/WP6 - 0110  
14 Dec 89

Letter & Report from Godber (Ad Hoc Group on  
Production Planning) to PS Chair, Re: Production budget

PS/WP6 - 0111  
18 Dec 89

Letter from NASA (Whyte) to Kodak (Weldy),  
Re: NASA negatives: Subjective test material

PS/WP6 - 0112  
18 Dec 89

Meeting Minutes PSWP-6 (Dec. 6, 89) at CBS

PS/WP6 - 0113  
19 Dec 89

Agenda, Meeting Notice & 10th Meeting & Minutes  
Ad Hoc Group on Production Planning

PS/WP6 - 0114  
18 Dec 89

FAX from Thorp (Sony) to Godber (Ad Hoc Group)  
Re: Sony activities

PS/WP6 - 0115  
19 Dec 89

Report on Work of Ad Hoc Group on Production Planning

PS/WP6 - 0115a  
22 Dec 89

Draft Subjective Test Procedures Manual

PS/WP6 - 0116  
12 Jan 90

Letter from DSRC Carnes to PSWP6 Chair Jones  
Re: displays

PS/WP6 - 0117  
17 Jan 90

Meeting Cancellation Notice  
Re: Scheduled on February 14, 1989

PS/WP6 - 0118  
17 Jan 90

FAX from Faroudja, Rosner, to Ad Hoc Group Chair  
Godber, Re: action items

PS/WP6 - 0119  
25 Jan 90

Letter from PSWP6 Chair Jones to DSRC Carnes  
Re: PSWP6-0116

PS/WP6 - 0120  
26 Jan 90

Letter from ATTC Rhodes to PSWP6 Chair Jones  
Re: randomization of test trials

PS/WP6 - 0121  
30 Jan 90

Letter from ATTC Fannon to PSWP6 Vice-Chair Tanner  
Re: response to PSWP6-0103

PS/WP6 - 0122  
31 Jan 90

Letter from PSWP6 Chair Jones to ATTC Rhodes;  
Response to PSWP6-0120

PS/WP6 - 0123  
09 Feb 90

Letter from PSWP6 Chair Jones to Weldy & Pellow, Kodak  
Re: still test material

PS/WP6 - 0124  
14 Feb 90

"The Use of Multiple Presentation Orders in Subjective  
Tests", Hearty/CABSC

PS/WP6 - 0125  
14 Feb 90

"Status of Work in Identifying still pictures for ATV  
Tests, Hearty/CABSC

PS/WP6 - 0126  
14 Feb 90

Tanner paper on randomization

PS/WP6 - 0127  
16 Feb 90

Letter from Kodak to PSWP6 Chair, Jones  
Re: PSWP6-0123

PS/WP6 - 0128  
26 Feb 90

Meeting Notice Agenda, and Minutes from PSWP-6 Feb 14,  
1990 meeting in Alexandria, VA

PS/WP6 - 0129  
05 Mar 90

Ad Hoc Group on Production Planning  
Transaction of 11th meeting, agenda, value

PS/WP6 - 0130  
08 Mar 90

Chair's Report

PS/WP6 - 0131  
08 Mar 90

March 90 Document List

0132  
07-Mar 90

Letter from Zenith, Eilers to PSWP-6  
re: test material distribution

0133  
12-Mar 90

Letter from Jones to Zenith  
re: PSWP6 - 0132

# **CCIR**

## **CONCLUSIONS OF THE EXTRAORDINARY MEETING OF STUDY GROUP 11 ON HIGH-DEFINITION TELEVISION**

Geneva, 10 - 16 May 1989

DRAFT  
RECOMMENDATION XB/11

SUBJECTIVE ASSESSMENT METHODS FOR IMAGE QUALITY  
IN HIGH-DEFINITION TELEVISION

(Questions 3/11 and 27/11)

The CCIR,

CONSIDERING

- (a) that a number of Administrations and organizations throughout the world are currently evaluating high-definition television systems, and that in many parts of the world HDTV broadcasting is likely to become the primary medium of the next century;
- (b) that subjective assessments are a vital element in HDTV system design and selection;
- (c) that CCIR Recommendation 500-3 (MOD I) outlines a number of preferred subjective assessment methods for conventional television systems (625/50 and



525/60), many of the methodological details of which are also appropriate in the context of HDTV;

(d) that, nevertheless, it may be thought helpful to make clear the assessment methods and viewing conditions appropriate for HDTV, in the key areas currently under study, by a separate Recommendation.

[UNANIMOUSLY] RECOMMENDS

1. that subjective assessments of image quality of high-definition television systems should be made with the viewing conditions given in the Annex;
2. that subjective assessments of the overall quality of an HDTV image delivered by an emission system should be made using a double-stimulus continuous-quality scale method (Recommendation 500-3 (MOD I)) with the HDTV studio standard as reference\*;
3. that assessments of the failure characteristics of an HDTV emission system should be made using a double-stimulus impairment scale method (Recommendation 500-3 (MOD I)) with either the image of the HDTV studio or the image of the unimpaired emission as reference\*;
4. that, in the absence of a high-quality reference, the graphic scaling method or the ratio scaling/magnitude estimation method should be considered for assessments of overall quality of the image (before or after processing) provided by an HDTV studio system (see Report 1082 (MOD I));
5. that, when a high-quality reference is available, the double-stimulus continuous quality method (Recommendation 500-3 (MOD I)) should be considered for assessments of overall quality of the image (before, or after processing) provided by an HDTV studio system\*;
6. that, in the interpretation of the results of particular studies, due note be taken of any real limitations that current technology may impose upon the results of the study (e.g., bounding effects of pick-up or display devices);
7. that care must be taken to distinguish the influence of the display format from that of the basic system format (e.g., any up-conversion). Assessments may be performed in order to take account of the different formats if applicable and appropriate.

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\* Report 1082 (MOD I) should be consulted for advice on possible linguistic differences in the use of the terms for quality and impairment.